original form may ultimately prove to be inadequate, but so far it stands alone as affording any reasonably satisfactory explanation of the varied phenomena of steel. Its importance was recognised by the award to Osmond in 1897 of the Lavoisier medal of the Société d'Encouragement, and of the Bessemer medal of the Iron and Steel Institute in 1906.

More recently Osmond devoted himself to the study of the crystallography of iron in its various allotropic modifications, and to a study of the modes of plastic deformation of iron and steel. It was in this connection that the writer first came into personal contact with Osmond; divergent views led to a prolonged correspondence, at first of a controversial kind, but the controversy led not only to new experimental work on both sides, but resulted in producing substantial agreement and in building up a personal friendship. Osmond's unfailing courtesy and charm of manner and expression were typical of the man, while his fruitful mind filled all his utterances with thoughtful suggestions.

Osmond was one of the pioneer workers—perhaps *the* pioneer worker—of steel metallography; his work is naturally bounded by the limitations which hedge all the earliest workers in any new field of research, but however much the widening scope of the science may lead us away from some of Osmond's views, yet his fundamental work will always remain as a splendid monument—one of the foundation stones upon which the systematic scientific control of the great steel industry is being surely, if slowly, erected. It may be hoped that his French colleagues will give that monument a fitting shape by republishing in convenient form those numerous memoirs—more than eighty in number—which he contributed to the subjects with which his name will always be identified.

WALTER ROSENHAIN.

NOTES.

AT a meeting of the Lawes Agricultural Trust Committee held on June 25, Dr. E. J. Russell, at present Goldsmiths' Company's assistant for soil investigations, was appointed director of the Rothamsted Experimental Station in succession to Mr. A. D. Hall, F.R.S.

AT the extra meeting of the Chemical Society held on June 26, the president announced that the session for 1912-13 would open with a memorial lecture in honour of Antoine Henri Becquerel, late honorary and foreign member of the society, to be delivered by Sir Oliver Lodge, F.R.S., on October 17, and that further particulars would be given later.

AN extra meeting of the Chemical Society was held at Burlington House on June 26, Prof. Percy F. Frankland, F.R.S., president, in the chair, when Sir William Tilden, F.R.S., delivered a memorial lecture in honour of Prof. Stanislao Cannizzaro, late honorary and foreign member of the society. A brief account of the early life and education of Cannizzaro was given, and reference made to the part played by him in the political agitations of 1847 and 1860. In 1861 he was appointed to the chair of chemistry at Palermo University, and ten years later he was made professor of chemistry at the University in Rome, a position he held up to the time of his death on May 10, 1910. Sir William Tilden gave a sketch of the position in which science and education were held in Italy up to 1860, and dwelt at some length on Cannizzaro's valuable contributions to chemical knowledge; to the great part played by him as a teacher, and to the important public office held by him in the advancement of science and education. Sir William Ramsay, who proposed a vote of thanks, and Sir Edward Thorpe, in seconding it, gave personal reminiscences of Cannizzaro, as well as referring to his high scientific attainments.

AT the annual general meeting of the British Academy, held in the rooms of the Royal Society on July 1, Dr. A. W. Ward (master of Peterhouse, Cambridge) was re-elected president, and Sir W. R. Anson, M.P., Mr. A. C. Bradley, Mr. D. G. Hogarth, Lord Justice Kennedy, and Prof. C. W. C. Oman were appointed members of council.

AT the general meeting of the Faraday Society held on July 2, the following officers were elected:—*President,* Dr. R. T. Glazebrook, F.R.S.; *Vice-Presidents,* Dr. G. T. Beilby, F.R.S., Prof. K. Birkeland, Sir Robert Hadfield, F.R.S., Mr. F. W. Harbord, Prof. Bertram Hopkinson, F.R.S., Mr. Alexander Siemens, and Prof. James Walker, F.R.S.; *Treasurer,* Dr. F. Mollwo Perkin.

THE following have been elected as officers of the Royal Society of Medicine for the session 1912-13:—*President,* Sir Francis H. Champneys, Bart.; *Honorary Treasurers,* Sir William S. Church, Bart., K.C.B., and Sir Henry Morris, Bart.; *Honorary Librarians,* Sir Rickman J. Godlee, Bart., and Dr. Norman Moore; *Honorary Secretaries,* Mr. H. S. Pendlebury and Dr. E. F. Buzzard.

THE autumn meeting of the Iron and Steel Institute is to be held at Leeds on September 30—October 4. On October 1 the members will be welcomed by the Lord Mayor of Leeds, and a selection of papers read and discussed. Similarly, the mornings of the two following days will be devoted to the reading and discussion of papers. Several receptions and numerous excursions have been arranged.

THE Geologists' Association has arranged for the beginning of August next an excursion to West Mayo and the Sligo district. The excursion, which will be conducted by Prof. G. A. J. Cole and Mr. W. B. Wright, is planned to give a general view of the structure of central Ireland, and, in addition, to provide the opportunity for observations round Sligo. Those taking part in the excursion meet at Broadstone Station, Dublin, on July 31, and an itinerary has been arranged lasting until August 9.

THE Linnean Society has issued an appeal to its fellows and their friends for contributions towards the cost of production of a "Nomenclator animalium generum et subgenerum," in course of preparation under the auspices of the Royal Prussian Academy of Sciences, and edited by Prof. F. E. Schulze, of the University of Berlin. The "Nomenclator" is expected to include 200,000 references gathered by specialists of different countries. The extreme limits of date are 1758 to 1910. The work is well in hand, but the costs are heavy and the editor needs about 1000*l.* to ensure publication at an early date. Cheques and postal orders may be made payable to "The Linnean Society," Burlington House, W.

THE Postmaster-General announces that reduced rates have been adopted for the transmission of the 10 a.m. Greenwich Time Signal over private wires to premises in the London telephone area. If the address to which the signal is to be sent is within half a mile in actual distance from a London town sub-post office, and telegraphic arrangements permit of the direct signals being sent to that office, the charge will be 6*l.* per annum, covering the provision of the necessary wires to the renter's address. If the address is more than half a mile from the telegraph office, the charges of 4*l.* per mile for wire on the roads, or 5*l.* per mile for over house or underground wires on existing routes, will apply to mileage in excess of the first half-mile.

A VIOLENT storm passed over the city of Regina, the capital of the province of Saskatchewan, at 5 p.m. on Sunday, June 30, causing the loss of thirty lives and great destruction to property. A Reuter message from Ottawa states that in the history of western Canada no such storm has been known. Before it entered the city the storm passed directly over the new Provincial Parliament buildings, south of Wascana lake, and did much damage there. The path of the storm to the north was over the Dominion gaol buildings, and it then struck the best residential section, where two hundred buildings were blown down. The storm passed over the Canadian Pacific Railway, taking down in its course half a dozen grain elevators. It then traversed that portion of the city lying north of the railway, and the residential district beyond, where a number of fine structures were demolished. The storm lasted only three minutes, and its path of destruction was about three hundred feet wide.

THE final shipment of the extensive natural history collection made by the Paul J. Rainey expedition in British East Africa has just been received at the U.S. National Museum. The collection includes some 4000 specimens, more than 700 of which are those of large game. Mr. E. Heller was the guest of Mr. Rainey on his African hunting trip, and accompanied the expedition for the purpose of preserving the animals secured. Mr. Rainey has given the entire collection to the Smithsonian Institution and the National Museum. The territory traversed by the expedition was mostly to the north and east of that covered by Colonel Roosevelt on the earlier Smithsonian expedition, and included the country lying between the northern part of British East Africa and southern Abyssinia.

THE oration delivered in the University of Glasgow on Commemoration Day on June 25 by Prof. F. O. Bower, F.R.S., on the life and work of the late Sir Joseph Hooker, has been published by Messrs. MacLehose and Sons, of Glasgow. Hooker received his school and university education in Glasgow, and though after he left the city in 1839 he never returned to it as a resident, the University is rightly proud of her distinguished alumnus. Hooker's career has been dealt with so recently in these columns that it will be sufficient to commend Prof. Bower's eloquent and appreciative oration to the reader's attention as a scholarly account of the work of a great botanist by a distinguished worker in the same field. The last occasion when Hooker visited Glasgow was at the Jubilee celebrations of Glasgow University in 1901, when, with Kelvin and Lister, he appeared before the Chancellor to present an address on behalf of the Royal Society.

THE health conscience of the nation is awakening. We are realising the moral wrong, economic folly, and national loss entailed by a wilful or ignorant persistence in hygienic lawlessness. It is something to recognise an ill and sympathise with sufferers, but it is better to minimise the wrong and alleviate the afflicted, and, above all, it is best to prevent the errors, sins, and indiscretions which are the sources of suffering, delinquency, dependency, and human wastage. The recent Biennial Health Conference and Exhibition, held in cooperation with the National Health Society, under the patronage of H.R.H. Princess Christian, at the Royal Horticultural Hall, Westminster, and the adjoining L.C.C. Technical Institute, on June 24–27, has assisted in making us understand that an awakened conscience must be coordinated with an informed intelligence. Medical leaders, health visitors, sanitary administrators, and many thoughtful men and women working for the betterment of national life cooperated in discussing problems relating to the well-being of our people. A full and varied programme was provided. Papers were given and conferences held on infant consultations, tuberculosis and the child, the notification of births, the prevention of deafness in children, schools for mothers, housing, health-promoting agencies, the teaching of domestic economy in schools, the care and control of the feeble-minded, and much else of national service. Popular lectures were delivered, and there was an interesting exhibition.

JULY has opened with similarly wet weather to that which characterised the whole of June, and the aggregate rain in parts of London, as well as at many other places in the country, for the first two days of July is greater than the fall for the whole month last year. June was very wet this year over the entire country, and in most parts of England the rainfall for the first fortnight was in excess of the average for the whole month. The heaviest rains were generally in the western districts, and at Valencia the measurement for the month was 7·48 in., which is 222 per cent. of the average for June, and rain fell on twenty-three out of the thirty days. At Jersey the rainfall was 4·89 in., which is 234 per cent. of the average for the month. At Nottingham rain fell on twenty-six days out of thirty, yielding 3·29 in., which is 1·01 in. more than the normal. The rainfall varied considerably over the London area, although it was everywhere in excess of the average; at Greenwich the measurement was 2·34 in., which is an excess of 0·40 in., at Kew the amount was 3·12 in., which is 0·87 in. in excess of the average, whilst at Camden Square the measurement was 3·22 in., and at Hampstead 3·59 in. The mean temperature for June at Greenwich was 59·8°, which is 0·5° above the average of the last sixty years, and is only 1° below the mean for June last year, whilst the rainfall this year was only 0·23 in. greater, and the duration of sunshine, 219 hours, is 37 hours more than the normal, and only 5 hours fewer than in June last year.

THE summary of the weather for the first six months of the present year, issued by the Meteorological Office, shows that the rainfall for the period is in excess of the average in all districts of the United Kingdom, with the exception of the north of Scotland. In the north-east of England the rainfall so far this year is 139 per cent. of the average, in the Midland counties 136 per cent., and in the south-west of England 130 per cent. of the average. In the south-east of England, which district embraces London, the rainfall for the six months is 123 per cent. of the average. The duration of bright sunshine for the first half of the year is in defect of the average, except in the south-east of England, where there is a slight excess.

IN *The Museums' Journal* for June, Dr. F. A. Bather describes an open-air folk museum recently established by the local schoolmaster of Bunge, a thinly inhabited parish in the north of the Baltic island of Gotland. Part of the meadow occupied by the museum contains a seventeenth-century farmhouse, which forms the nucleus of the collection. In the farmyard various primitive agricultural implements are exhibited, and in the adjacent smaller buildings representations of local industries now passing away are shown. One peculiar feature of the museum is a patch of ground containing models of various forms of burial practised in the neighbourhood from the first century B.C. to the fourth or fifth A.D., including a model of a stone monument in the shape of a Viking ship. Close by is a judgment circle of eight large stones, and in another part of the grounds is a thingstead, a circle of small stones with a mound for the speaker. The conception throughout is admirably practical, and the plan might well be adopted in some of our schools, the local character of the exhibition being carefully maintained.

THE first number (April 30) of a new serial published at Buenos Aires, under the title of *Boletin de la Sociedad Physis,* contains a biography, illustrated by a portrait, of the late Dr. Florentino Ameghino, by Mr. M. Doello-Jurado.

IN the report of the Museums Committee of the University of Glasgow for the past year, Prof. Graham Kerr states that the expenditure of a special grant during the last few years has resulted in a great improvement in the condition of the zoological collections, which are now beginning to meet the requirements of the teaching staff. There is, however, still urgent need of additional funds for this purpose.

IN vol. ix., pt. 2, of "Annals of the S. African Museum," Prof. H. H. W. Pearson records the botanical and meteorological observations made by the Percy Sladen Memorial expedition to the Orange River in 1910–11. August to October is the great flowering season in the districts traversed, and it is probable that many of these (southern) spring-flowering species are still unknown. Accidents to the instruments interfered with the meteorological observations. In a second article Prof. Pearson and Miss E. L. Stephens deal with the plants collected during the expeditions of 1908–9 and 1910–11.

THE first number of a new periodical, the *Zeitschrift für Gärungsphysiologie,* contains papers by S. Lwow, on the action of diastase and emulsin on alcoholic fermentation and the respiration of plants, C. Gorini, on certain bacteria bringing about proteolytic changes in cheese, and a long and useful summary by Dr. Löhnis of work done during 1910 and 1911 on the bacteriological changes in food materials, milk, &c. Altogether the new periodical promises to be very useful to all investigators of fermentation problems.

A WELL-ILLUSTRATED account of the New England trees in winter has recently been issued as Bull. No. 69 of the Storrs Agricultural Experiment Station, Connecticut, by Messrs. A. F. Blakeslee and C. D. Jarvis. As the authors truly observe, the study of trees in winter is one of the most interesting subjects of a nature-study course, and in order to facilitate it they have prepared descriptions with photographs of the tree, twig, fruit, and, in the case of evergreens, the leaf, of all the common trees of New England.

THE climatic limits of wheat cultivation in Canada have recently been determined by Dr. J. F. Unstead so far as is possible on the available information, and the results are issued in *The Geographical Journal* (vol. xxxix., No. 4). Two well-defined regions exist, the larger being in the west. The line bounding the regions skirts the Rocky Mountains to a point north of Fort Simpson, and within 400 miles of the Arctic circle, and then falls in a south-easterly direction to Lake Superior. From here it strikes northwards and then abruptly eastwards, skirting James Bay and coming out on the gulf of the St. Lawrence. In the eastern region the limiting factor is not entirely climatic, for the glaciation of the region around Hudson Bay has left a large proportion of the surface in such a condition that wheat cultivation is either difficult or impossible. The limits, so far as they are imposed by climate, are always liable to be set back somewhat as new varieties of wheat are bred suitable for cold regions, and a good deal of this work is going on in Canada.

MEASUREMENTS of the temperature of flowing lava are so rare that some made by Prof. G. Platania during the eruption of Etna last September possess considerable interest (*Rend. della R. Accad. dei Lincei,* vol. xxi., 1912, pp. 499-502). His observations were made with a Féry's radio-pyrometer on a stream of lava flowing from the lowest of a string of craters in the neighbourhood of M. Rosso, a few days before the eruption ceased. The temperatures, in parts where the lava was still red, ranged from 795° to a maximum of 940° C.

The last great eruption of Etna began on September 10, 1911, and, notwithstanding the extraordinary energy of the outburst, came to an abrupt end in thirteen days. The subterranean activity, however, continued in other forms, and Prof. A. Riccò, in a recent paper (*Boll. della Soc. Sismol. Ital.*, vol. xvi., 1912, pp. 9–38), describes as successors of the eruption the Fondo Macchia earthquake of October 15, the Maltese earthquake of September 30, and a series of earthquakes recorded at Mineo from October 17 to the end of December. Of these, the most interesting is the earthquake of Fondo Macchia, a village lying to the east of Etna. Though the disturbed area of this earthquake is only twenty-four miles long and eleven miles wide, it caused considerable damage to villages (resulting in twelve deaths) within a narrow band, four miles long and about a third of a mile wide, running from Fondo Macchia towards the S.S.E. Precisely the same district was the seat of a similar disastrous earthquake on July 19, 1865, when seventy-four persons were killed; and it is interesting to notice that this earthquake occurred eighty-eight days after the close of a violent eruption of Etna, while the recent shock occurred twenty-two days after the end of the last eruption.

Mr. Warren Smith, head of the Department of Geology in the Bureau of Science which the American Government has established in the Philippines, has issued a report upon the mineral developments during the year 1910. The most valuable mineral products of the Archipelago are gold, coal, and iron, which yielded a total value of about 250,000 dollars. The remaining non-metallic minerals, including gravel, sand, lime, clay, and rough andesite, which is crushed for use as concrete, contributed a total yield of more than three times that value. The coal is of Miocene or Oligocene age, as it is overlain by a limestone containing the *Lepidocyclina insulaenatalis* of Chapman. Gold has been found in many provinces, and the chief yield has been from the alluvial deposits. One of the most interesting chapters in the report is Mr. Fanning's account of the goldfield of the Paracale-Mambulao district, which yielded more than half the total gold supply of the Philippines. There are indications of oil in the Philippines, but though the ground has been prospected, no very definite results were obtained during the year.

The meteorological charts of the North Atlantic and Mediterranean for July, issued by authority of the Meteorological Committee, contain much useful information respecting North Atlantic ice. The earliest trustworthy date on which ice of any kind was observed each year from 1903 to 1911, and subsequently reported to the Meteorological Office, was March 6, February 9, January 18, January 2, February 2, January 1, January 24, March 2, and January 28 respectively. Drifting ice may be observed almost anywhere in mid-ocean north of 30° N.; and north of 35° N., about as far east as longitude 10° W. and about as far west as longitude 75°. A tabular statement shows that both icebergs and field ice were further south in 1912 than in any other year of the period 1901–12; icebergs, 38° 21′ N., in May, and field ice, 40° 0′ N., in April. The first berg of 1912 was passed on January 7 in 46° N., 53° W., but ice has been present since January 28, 1911; since the middle of February reports of both icebergs and field ice have been numerous. The loftiest bergs this season were sighted from the *Carmania* about 42½° N., 49½° W., on April 10; some were 400 ft. high and half a mile long. The chart issued by the Deutsche Seewarte also contains special notices relating to ice in the Atlantic.

A brief account of the national parks created by the United States Government is given in *The Popular Science Monthly* for June by Mr. Laurence F. Schmeckebier. Probably the best known to English people are the Yellowstone, the Yosemite, and the Colorado Grand Canyon, but a large number of other reserves and national monuments are here detailed. For the administration of these a Government department exists, the officials of which have devoted much voluntary overtime labour to their efficient administration. One of their latest enterprises has been the publication of illustrative guides dealing with the natural curiosities and describing their scientific points of interest in popular language.

The report on electrons in metals prepared by Dr. L. Amaduzzi, of Bologna, for the Italian Physical Society and the Italian Society for the Advancement of Science, has been amplified by the author, and now appears as one of the volumes of the series "Attualita Scientifiche." In this form it serves as a suitable continuation of the author's volume on the ionisation and electrical conduction in gases in the same series. It gives a clear account of the theories of Drude and of Lorentz on the thermal and electrical conductivities of metals, and shows how the electrons with adequate speeds may escape from a metal into the surrounding gas and so constitute the "thermionic current" of Richardson. Langevin's theory of magnetism and Weiss's extension of it to ferro-magnetic substances are treated at some length, and the Hall and other similar effects touched upon. The volume concludes with a short account of the part played by electrons in the modern theory of radiation. It is easy to read throughout, even with a very modest knowledge of Italian, and as the information it contains has not been collected together in any English book, Dr. Amaduzzi's pamphlet will be welcome to many physicists in this country who wish to keep abreast of modern theory.

The Builder for June 28 gives reproductions from photographs of a house constructed in one piece by pouring concrete into a single mould previously erected. This house—the first of its kind—has been cast on the Small-Harms system at Santpoort, a seaside resort near Haarlem. The house covers an area of 39 square metres, and comprises six rooms on two floors. The cost is given at 144*l*. The flat roof, the floors, and the stairs are of slabs fixed in place while the moulds were being erected. Chimney flues and other stoneware pipes were enclosed in the moulds and embedded in the concrete subsequently poured in. The mould consisted of some 2600 castings of size and weight convenient for handling, and assembled by about 10,000 bolts and nuts; the erection of the mould occupied about eight days, pouring about six hours, followed by two days' rest; removal of the mould occupied two days, making thirteen days in all for construction. Colloidal material is added to the concrete in order to avoid segregation and to facilitate its flow to all parts of the mould.

A USEFUL bibliography of the papers and records published with respect to the geology and palæontology of the north of England (Yorkshire excepted) during 1910 was contributed by Mr. Thomas Sheppard to *The Naturalist* in May and June of this year. The bibliography has now been issued in pamphlet form by Messrs. A. Brown and Sons, Ltd., of London, Hull, and York.

MR. FRANCIS EDWARDS, of High Street, Marylebone, London, W., has issued a catalogue of books relating to Australasia, which he is offering for sale. The books include some important volumes on the Antarctic.

ERRATUM.—In NATURE of June 27, p. 426, col. 2, line 41, for 89½ miles read 63¼ miles.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR JULY:

July 4. 12h. 0m. The Sun at greatest distance from Earth.
5. 14h. 0m. Venus in superior conjunction with the Sun.
10. 16h. 13m. Saturn in conjunction with the Moon (Saturn 5° 36′ S.).
13. 8h. 31m. Venus in conjunction with Neptune (Venus 1° 27′ N.).
14. 2h. 29m. Neptune in conjunction with the Moon (Neptune 5° 34′ S.).
,, 3h. 58m. Venus in conjunction with the Moon (Venus 4° 6′ S.).
15. 17h. 24m. Mercury in conjunction with the Moon (Mecury 3° 57′ S.).
,, 23h. 0m. Neptune in conjunction with the Sun.
16. 12h. 9m. Mars in conjunction with the Moon (Mars 2° 46′ S.).
22. 1h. 0m. Venus in perihelion.
23. 18h. 12m. Jupiter in conjunction with the Moon (Jupiter 4° 36′ N.).
24. 7h. 0m. Uranus at opposition to the Sun.
25. 3h. 0m. Mercury at greatest elongation E. of the Sun.
28. 5h. 45m. Uranus in conjunction with the Moon (Uranus 4° 21′ N.).
29. 10h. 0m. Mercury at greatest distance from the Sun.

THE NOVA OR VARIABLE 87, 1911, PERSEI.—On April 3 Prof. Wolf gave an hour's exposure, with the reflector, on the region of the nova, or variable star 87, 1911, Persei, discovered by Mr. C. R. D'Esterre, and the photograph is reproduced, together with Mr. D'Esterre's plate of November 13, 1911, for comparison, in No. 4585 of the *Astronomische Nachrichten*. On Prof. Wolf's plate the nova(?) is very faint, while on the earlier plate it is comparable in brightness with two of the brightest stars seen on both photographs. Practically identical with the position of the nova(?) there is a faint pair of stars, the more northerly of which Prof. Wolf shows to be variable, so the region is evidently one of exceptional interest.

PERSEIDS IN AUGUST, 1911.—Simultaneous observations of meteors were made by Herren Büss and Djukow at Dorpat and Elwa respectively, on August 9–12, 1911; Elwa is not very far west of Dorpat. The results are tabulated in No. 4582 of the *Astronomische Nachrichten*, and embody the observed paths of 122 meteors observed at the former and 31 observed at the latter station. The maximum took place on August 12, and some of the observed paths were curved or wavy; there was a tendency also, noted on previous occasions, for the Perseids to appear in pairs travelling along parallel paths. A number of radiants were determined, the mean position being $\alpha = 44{\cdot}5^\circ$, $\delta = +56{\cdot}5$. Nine meteors were recognised in both records, and the heights of the appearance and disappearance were calculated; these range from 40·5 to 103·6, and from 30·5 to 101·0 kms. respectively.

OBSERVERS' HANDBOOK.—We have received the first fascicule of a work by M. G. Raymond, entitled "Les Merveilles du Monde Sidéral," in which the author gives brief descriptions and positions of the interesting celestial objects found in the first six hours of right ascension. The book reminds one of the "Celestial Objects," only that the author has arranged the double stars, nebulæ, &c., under single hours of right ascension, giving the constellations in each hour in alphabetical order; thus, for example, the especially interesting objects in the constellation Andromeda are found in six different parts of the book under 0h., 1h., 2h., 21h., 22h., and 23h. The positions are given to the nearest minute for 1910, and amateur observers should find the work most useful; it is published by G. Thomas, 11 rue du Sommerard, Paris, at 4 francs for the one part.

VARIABLE STARS OF SPECIAL INTEREST.—The light-variations of twenty-five variable stars in the Small Magellanic Cloud are discussed by Miss Leavitt in Circular 173 of the Harvard College Observatory. A previous investigation indicated that there existed a relation between the brightness of these variables and the length of their periods, and this is confirmed in the present study; the logarithm of the period (in days) increases by about 0·48 for each increase of one magnitude in brightness. As the distances from the earth are presumably alike, it would appear that the period is associated with the actual emission of light determined by the physical conditions of the stars. The average range of brightness is about 1·2 magnitudes, and the periods range from 1·2 to 127 days.

Circular No. 171 contains the data for the light-curves of five variable stars having secondary minima. One of these, RT Persei, appears to be an Algol variable, and the other four, RV Ophiuchi, V Serpentis, RZ Draconis, and U Scuti, are of the β Lyræ type.

SEARCH-EPHEMERIDES FOR COMETS.—In No. 4577 of the *Astronomische Nachrichten* Dr. Hnatek publishes ten search-ephemerides for comet 1852 IV. (Westphal); the periods on which the ephemerides are respectively based range from 60·2 to 61·0 years, increasing in steps of 0·1 year. The comet is far south, and is not likely to be found during the present year.

Dr. H. J. Zwiers has calculated elements for Holmes's comet, based on the observations of 1906, and in No. 4584 of the same journal he gives an ephemeris for June and July. The comet is unfavourably placed, and is not observable in these latitudes.